CORRESPONDENCE

Risk factors for colonization with enterococci in a neonatal intensive care unit

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Enterococci are increasingly recognized as important nosocomial pathogens. Studies in children have shown that neonates and compromised hosts are especially at risk; that bacteremia and sepsis were the most prominent manifestations of infection; that enterococcal bacteremia occurred often in the setting of polymicrobial infections and that the attributable mortality was about 20–25% [1–4]. In the present study risk factors for colonization with enterococci in newborns are described. A retrospective case-control study on risk factors for colonization with enterococci was performed in the neonatal intensive care unit (NICU) of the Beatrix Children's Hospital, Groningen, The Netherlands. All newborns admitted to the unit from 1 January 1994 until 31 December 1994 were included. Fecal and throat cultures were taken on admission and twice weekly afterwards. Infants were considered colonized when enterococci were isolated on esculin plates (Merck, Darmstadt, Germany) at least once from throat or faeces. Only faeces cultures in which enterococci were predominant were considered positive. Controls were a random selection of the newborns admitted during the study period and not colonized with enterococci during their stay in the NICU. Resistance to vancomycin was not determined in this study, since it is still a very rare event in the Netherlands [5].

Between 1 January 1994 and 31 December 1994, a total of 579 newborns were admitted of which 116 (20%) were colonized with enterococci. The site of colonization was the faeces in 54 patients, the throat in 51 patients and both faeces and throat in 11 patients. In an univariate analysis of possible risk factors for colonization with enterococci a shorter gestational age ($P < 0.001$), a lower birth weight ($P = 0.02$), an increased number of days of hospitalization, mechanical ventilation, treatment via a central venous line, parenteral nutrition and antibiotic use (all $P < 0.001$) were associated with enterococcal colonization. Major surgery and episodes of clinical features compatible with infection were also risk factors ($P < 0.001$). Multiple regression analysis showed that a longer gestational age [odds ratio(OR), 2.12; 95% confidence interval (CI), 1.04–4.34], a longer duration of hospitalization (OR, 1.07; 95% CI, 1.04–1.09), the use of antibiotics other than amoxicillin (OR, 3.32; 95% CI, 1.30–8.50) and the use of a central venous line (OR, 2.51; 95% CI, 1.12–5.63) were the only independent risk factors (Table 1).

Table 1 Multiple regression analysis of risk factors for colonization with enterococci

	OR	95% CI	*P*
Gestational age >37 weeks	2.12	1.04–4.34	0.039
Days of hospitalization	1.07	1.04–1.09	<0.001
Deep venous line in place	2.51	1.12–5.63	0.026
Antibiotics other than amoxicillin	3.32	1.30–8.50	0.013

OR, odds ratio; CI, confidence interval.

Neonates with these risk factors should be monitored closely for the development of enterococcal bacteremia and sepsis.

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Cutaneous sporotrichosis: the old iodide treatment remains effective

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Sporotrichosis, a common disease in the Midwestern river valleys of the United States and rare in the state of Michigan, clinically mimics other diseases that are frequently associated

with the occupation of patients, such as mycobacteriosis, cryptococcosis, woolsorters' disease, cat scratch disease and nocardiosis. A strong clinical suspicion may be confirmed by isolation of the organism. Treatment of sporotrichosis can be difficult, mainly due to patient compliance over the long duration of treatment. In addition, the treatment is expensive, especially with use of the new antifungal drugs, although these are better reserved for systemic forms of the infection. The cutaneous form of the disease can be treated in the 'old' way, with a saturated solution of potassium iodide (SSKI), which is inexpensive. We present such a case to emphasize the usefulness of such therapy.

Eight months prior to his referral to a county free clinic, a 40-year-old man had cut his left index finger near the knuckle while working in a garden. He had always worked in jobs such as yard work or swimming pool cleaning that exposed him to soil or water. The lesion became erythematous and nodular and later formed crusts without purulent discharge. After 2 to 3 months, he noticed an increasing number of similar lesions proximally on the lateral and dorsal aspect of the upper extremity, reaching the lower part of his arm. The sizes of the lesions increased to about 2 cm in diameter and in the few weeks prior to his visit to the clinic, these lesions were more nodular and tender. He had no itching, no fever, no chills, no arthralgia nor joint swelling, and no cough.

On examination, the patient was a well-built, healthy man. His temperature was 37.3 °C, pulse was 80/min. and respiratory rate 16/min. With the exception of the skin lesions, the physical examination was essentially within normal limits. On the left upper extremity he had multiple lesions 1.5 to 2 cm in size with central excoriation and erythematous border. He also had several smaller, slightly tender erythematous nodules. These were present from the original lesion at the left index finger to the lower arm, as shown in Figure 1. He had no lymphadenopathy.

Laboratory investigations yielded the following: white blood count (WBC) was 9300, hemoglobin 16.2 gm%, hematocrit 47.2%, platelet 342 000 with normal differential count; erythrocyte sedimentation rate (ESR) was 5 mm in the first hour. The chest X-ray was normal. A direct microbiological examination from two lesions was negative for fungus, but the culture showed moderate growth of *Sporothrix schenckii*. Smear and culture tests for mycobacteria were negative.

The patient was followed at our Infectious Disease Clinic. After we diagnosed cutaneous sporotrichosis, he was treated with SSKI. The initial dose level was 0.5 mL, taken three times a day, and this dose level was increase by 0.5 mL per day until it reached 4 mL, taken three times a day. He took the SSKI mixed in juice. After 1 month, there was significant improvement—the lesions had decreased in size by at least 50%; there was no crust and hardly any nodular lesions. His last visit was 8 weeks after initiation of therapy. By this time, he had taken SSKI for nearly 7 weeks (he interrupted treatment for 10 days because of a minor side-effect – bitter taste). Figure 2 reveals the healing of all lesions. He had suffered no relapse at follow-up, 8 months after SSKI was discontinued.

Cutaneous/lymphocutaneous sporotrichosis, a mycotic infection, has a chronic course and usually affects individuals who are exposed to soil or other environmental or plant (thorns or wood) sources that may lead to traumatic inoculation of the causative agent *Sporothrix schenckii*. Among other conditions to be considered on the differential diagnosis are mycobacteriosis, cryptococcosis, blastomycosis, cutaneous anthrax, nocardiosis and bacillary angiomatosis or pyogenic infections. The clinical diagnosis can be confirmed by the isolation of the organism as in the case presented.

Standard treatment of sporotrichosis is by using antifungal drugs for an extended period of time. SSKI had been the drug of choice for this form of sporotrichosis since the early part of this century. More recently, the azole antifungal agents have

Figure 1 Lesions from cutaneous sporotrichosis appearing at left index finger to lower arm on initial visit.

Figure 2 All lesions healed 8 weeks after SSKI therapy. The patient had no relapse after 8 months.

superseded the use of SSKI. Some of the side-effects—such as bitter metallic taste, nausea, rash and anorexia—have been the reason for limited use, but it remains an inexpensive therapy in developing countries. We elected to treat our patient, who was first seen in a free clinic, with SSKI, an effective and inexpensive drug, rather than using the newer, costly azole antifungal drugs. There has been dramatic improvement in the lesions as shown in Figure 2. The drawback of the drug is the adverse effect that occurred in this patient several weeks after he started treatment.

We emphasize that in this era of cost containment, the use of SSKI is an inexpensive and effective treatment for cutaneous/lymphocutaneous sporotrichosis.

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Successful treatment of *Actinobacillus actinomycetemcomitans* endocarditis with ofloxacin

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Endocarditis due to HACEK organisms (*Haemophilus* sp., *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens*, *Kingella kingae*) are usually treated with ampicillin or ceftriaxone plus an aminoglycoside for 4 weeks. That treatment can be difficult to achieve in patients with poor venous access or in cases of allergy to β-lactam antibiotics. Fluoroquinolones are antibiotics characterized by an excellent oral bioavailability and a high diffusion in tissue and cardiac vegetations [1]. Thus, they could be an interesting alternative to the β-lactam-aminoglycoside treatment. To our knowledge, only one case of *A. actinomycetemcommitans (Aa)* endocarditis being successfully treated by fluoroquinolone has yet been reported [2]. We present here a second case.

A 65-year-old man was admitted to the Infectious Disease Department on January 1998. He had been suffering for 30 years with mitral regurgitation complicating a mitral valve prolapse. During the past 3 months, he presented with three febrile episodes, each of which was rapidly resolved after an oral antibiotic treatment given by his family doctor. Successive echocardiographic examinations performed by his cardiologist, including a transoesophageal echocardiography, showed a recent worsening of the mitral regurgitation (grade 3–4), without vegetations.

On admission, he was febrile (38.2 °C). The physical examination found only the known mitral regurgitation murmur. There was no sign of cardiac failure. Urine-analysis was normal. Inflammatory parameters values were: ESR, 122 mm; C-reactive protein (CRP), 122 mg/L. Three of six blood cultures were positive for *Aa*. The rod was sensitive to: ampicillin, third-generation cephalosporins, macrolides, tetracyclines, aminoglycosides and fluoroquinolones (ofloxacin and ciprofloxacin). Dental examination revealed the presence of an infectious focus on tooth 47. *Aa* endocarditis was diagnosed.

Initial treatment was with amoxicillin and netilmicin. The patient became afebrile on day 5 of treatment. On day 8, intravenous treatment was rendered impossible due to insufficient peripheral venous access. Ofloxacin oral treatment at a dosage of 200 mg three times daily was initiated. At this time, the ESR was 120 mm and CRP, 47 mg/L. Ofloxacin MIC against *Aa* was 0.03 mg/L by *E*-test. Fifteen days after the beginning of ofloxacin treatment, peak serum concentration of ofloxacin was 8.3 mg/L using high-performance liquid chromatography (Dr Jehl, Institut de Bactériologie, Strasbourg, France).

The duration of ofloxacin treatment was 5 weeks. Apyrexia persisted throughout the antibiotic treatment and inflammatory parameters returned to normal values. A new echocardiograph at the end of treatment confirmed the absence of vegetations or further worsening of mitral regurgitation. One year later, the patient remained free of clinical or biological signs of relapse.

In 1995, Babinchak reported a case of mitral prosthetic valve *Aa* endocarditis successfully treated by ciprofloxacin (750 mg, twice daily) [2]. The patient had no vegetations or cardiac failure. The outcome was favorable. The minimum inhibitory concentration (MIC) of ciprofloxacin against the rod was 0.019 mg/L. The serum level of ciprofloxacin at the steady state was 4.1 mg/L 6 h after the intake of 750 mg, which corresponded to approximately 200-fold the MIC of ciprofloxacin. We report a second case involving native mitral valve, in which ofloxacin, given at high dosage, permitted achievement of a peak serum level of more than 200-fold the MIC against *Aa*.

In experimental models of endocarditis, the bactericidal